

An Investigation on Industrial Transformation Strategies of Traditional Tea Factories

Cheng-I Hou¹, Yi-Hsien Lin², Chih-Yao Lo¹, Su-Ying Pen¹

¹ Yu Da University, Miaoli County, Taiwan

² Dayeh University, Changhua, Taiwan

Abstract

Because production costs have continued to increase, most of the factories of traditional manufacturing industry in Taiwan have been shut down one by one or moved to other countries where production costs are lower. As a result, few manufacturing factories rooting in Taiwan have faced great competition crisis. Tea industry is no exception. The decrease in tea plantation area and tea growers in Taiwan, as well as young people's unwillingness to take over tea factories, have led to the reduction of number of tea factories and the stagnation of development of tea factories. With the economic prosperity in Taiwan, citizens in Taiwan have gradually started to attach importance to leisure and entertainment in life, and the need for leisure and entertainment has led to the prosperous development of tourism industry. Traditional tea makers may use this phenomenon as the power for business transformation.

This study used literature review and modified Delphi method as the research methods to collect data, understand the current status of operation of tea industry and industrial transformation of tea industry operators in Taiwan, and investigate the cases of successful industrial transformation of tea industry. The research purpose is to develop the assessment criteria of strategies for industrial transformation of traditional tea factory operators as important basis for operators.

The research results showed that, the assessment criteria with the most critical impact on industrial transformation of traditional tea factories is "corporate theme and marketing context," followed by "industrial link and resources integration," "team internal structure," "value of the product and factory visit," and "spatial design and layout." Moreover, for alternative transformation schemes, the highest score is "tourism factory," followed by "tourism tea factory," "tea cultural (story) museum," and "tea house."

Keywords: *Tea factories, Industrial transformation, Modified Delphi method*

1. Introduction

In order to achieve the objective of sustainable development, enterprises constantly transform themselves and seek innovation and change, which leads to the phenomenon where enterprise competitiveness is dependent upon the transformation from "investment-driven" economy into "innovation-driven" economy [1]. In the early 1980s, industrial development in Taiwan was in an advantageous position. However, by the mid-1980s, energy crisis led to fierce international competitions. In addition, owing to the decline of economic environment in Taiwan, appreciation of New Taiwan Dollar, and rise of land and labor costs, labor-intensive industries were relocated to other countries rapidly. Moreover, because the government aggressively promoted high-tech industries and traditional industries relocated their factories to places of lower costs one by one, industrial relocation and factory shutdown even led to the idleness of lands or premises of traditional industries in Taiwan [2]. Tea industry is also no exception. The decrease in number of tea factories has led to the stagnation of development of most of the traditional tea factories. In recent years, the tea consumption of citizens in Taiwan has increased year by year due to the prosperous economy in Taiwan. Tea drinks have also been transformed, including canned drinks and chain of tea shops where cheaper tea leaves are needed to reduce operation cost. Therefore, the implementation of industrial transformation and refined industrial operation are the urgent and important issues for tea makers, and industrial transformation of tea industry is a feasible strategy [3].

The Ministry of Economic Affairs of R.O.C. proposed several effective plans for supporting industries. In 2003, it proposed "Tourism Factory Plan" to provide operators with supportive

techniques [4]. In addition, Executive Yuan promoted “Six Key Emerging Industries” in 2009 [5], leading to the increasing trend of cultural creativity industry. Besides, in recent years, the successful assistance and support for industries with local characteristics have enabled many traditional tea industry operators to aggressively implement industrial transformation, in order to combine industry with economy and culture. Moreover, elements of creativity and tourism have also transformed industrial crisis into new opportunities [6].

This study summarized experts’ opinions, and focused on analyzing the factors affecting the selection of industrial transformation by traditional tea factory operators, in order to develop objective assessment criteria. This study also analyzed and compared four alternative schemes to further select the best strategy for industrial transformation of tea factories, as well as proposed suggestions according to the research results.

2. Literature Review

This study intends to investigate the current status of development of tea industry in Taiwan, as well as the theories concerning industrial transformation of traditional tea factories. The literature review is as follows:

2.1 Outline of Development of Tea Industry in Taiwan

The restrictions on tea leaf import into Taiwan were loosened as early as in 1971. However, it was not until 1986 was the import/export of tea leaves changed to bulk import. As a matter of fact, in the past where tea leaf export was in the prime, the tea leaves exported abroad were mainly cheaper ones, and only a small proportion of expensive high-quality tea leaves were exported. At present, cheaper tea leaves from the Southeast Asia and China have replaced those in Taiwan. Under the situation where there is no international market for expensive tea leaves, the export of expensive tea leaves certainly has been changed to import of them. During the change from export to import, the current tea market

has been transformed, and the industrial transformation of tea industry has become an inevitable trend [7].

2.2 General Status and Operation Types of Tea Industry in Taiwan

There are diversified operation models and types in current tea industry in Taiwan. Apparently, most of the operators use horizontal or vertical operation. The current tea industry in Taiwan is divided into: nationwide tea research and extension stations, tea factories, tea wholesale suppliers, tea farms, tea set stores, tea supplier associations, tea houses, tea art forums, and online tea shopping [8]. There are approximately more than one thousand stores of various operation types. Therefore, the phenomenon of tea drinking by citizens in Taiwan and operation of tea industry are quite common. With the constant social changes and the implementation of five-day workweek, most of the traditional industries have faced the trend of micro industrial transformation, and even larger structural transformation. Therefore, the new classification method of tea industry has also been developed, including tourism factories, tourism tea factories, tourism tea gardens, tea art museums, tea cultural museums, tea museums, and tea story museums. As a result, tea industry satisfies the consumers in the society with a new appearance, and provides them with a variety of “tea” services.

2.3 Outline of Industrial Transformation

“Transformation” is the important operation objective of many traditional industries. On the one hand, traditional industries have to face the changes of external environment. On the other hand, they also have to face the development of their own life cycles and changes in operation advantages and disadvantages to adopt coping strategies [9]. Moriguchi Hachiro divided transformation into 5 categories: industrial pattern, operational pattern, product, market, and operational structure [10]. The most important key factors to the success of industrial transformation of enterprise organizational structure can generally be divided into manpower, planning, and finance [11]. The management practice work can be divided into primary and secondary management practices. Primary management practices include development of clear strategies,

impeccable implementation, performance-oriented enterprise culture, and maintenance of flat and rapid organizational structure. Secondary management practices include talent retaining, talent cultivation, leaders concentrating on operation of company, industrial innovation, and growth through merger and cooperation [12].

2.4 Modified Delphi Method

Delphi method is also called expert judgment, and is usually applied to qualitative studies. It is a research method using written form to integrate experts' opinions. During the research process of a specific issue, Delphi method uses the special experiences and knowledge of experts, several rounds of repeated Q & As, and statistical analysis methods until the differences among experts' opinions are insignificant. Modified Delphi method is generally the same as traditional Delphi method, and the difference is that it skips the complicated procedure of round 1 open-ended questionnaire survey [13].

3. Research Method

This study develops the assessment criteria of strategies for industrial transformation of traditional tea factories as reference for tea industry operators. The questionnaire survey is conducted to propose suggestions and obtain results. The research process is as follows:

3.1 Modified Delphi Method Expert Questionnaire Survey

In terms of the selection criteria for experts, this study selected scholars, experts, experts in tea associations and unions, and experts in tea factories as the respondents. In terms of the selection standard for experts questionnaire, this study mainly selected tea industry operators who sell tea leaves and tea-related products as the respondents. The respondents of the questionnaire survey on alternative schemes are the same as those questionnaire survey. After the questionnaires were returned, this study calculated the weights of various strategies to find out the best strategy for industrial transformation of tea industry operators. The pretest of modified Delphi method expert questionnaire survey was performed to preliminarily develop the assessment dimensions.

This study comprehensively collected data and performed investigations by referring to relevant books, papers, journals, and online resources. Moreover, study referred to the content of review on guidance plan of tourism factories of industrial technology research institute to preliminarily develop 7 items, and used two judgment criteria, "consistency" and "stability," as the indicators of end of expert questionnaire survey.

3.2 Development of Measurement Tools for Modified Delphi Method

this study interpreted, analyzed, and summarized the experts' opinions. The boxes of importance ticked by the respondents were used to reflect the measures of central tendency and measures of variation. This study used two judgment criteria, "consistency" and "stability," as the indicators of end of expert questionnaire survey. After the questionnaires of each round were returned, this study used function "AVERAGE" to calculate mean (μ), used "STDEV" to calculate standard deviation (σ), used σ/μ to calculate coefficient of variation (cv) (Murry & Hommons, 1995).

3.3 Judgment of Importance

Mean is a measure of central tendency in statistical data, and is mainly used to reflect the degree of concentration of data. Therefore, this study used mean (μ) as the indicator of importance. When mean (μ) ≥ 3.5 (70% in 5-point scale), the members of panel of experts suggested that the item is very important and should be retained.

3.4 Judgment of Degree of Consistency of Importance

SD and coefficient of variation are used to reflect the degree of concentration and dispersion of experts' answers to a certain item. When mean (σ) ≥ 1 and coefficient of variation (cv) ≥ 0.5 , the degree of dispersion of the item is too large and the opinions of experts are inconsistent. Therefore, the item should be deleted. If the difference in SD between the former and the latter rounds is gradually decreased, the degree of convergence is reached. When mean (σ) < 1 and coefficient of variation (cv) < 0.5 , the preliminary consensus is reached.

In the first round modified Delphi method questionnaire survey, the original 7 assessment

criteria were adjusted to 5 assessment criteria. In the second round modified Delphi method questionnaire survey, the results showed that the experts agreed with the 5 assessment criteria in round 1. Therefore, the 5 assessment criteria were retained.

In addition to various criteria, the “field of other opinions” was also included in the round 1 questionnaire to enable the experts to provide other suggestions according to personal professional experiences to develop impeccable assessment criteria. In the end, the experts were also invited to provide appropriate suggestions on industrial transformation schemes for the use of selection of schemes in this study. The results of round 1 questionnaire survey are shown in Table 1.

Table 1: Table captions should be placed above the table

Assessment Criteria	Frequency Distribution					Mean	SD	CV	Retain / Delete	Other Opinions
	5 (VI)	4 (I)	3 (N)	2 (U)	1 (VU)					
	Very important	Important	Neutral	Unimportant	Very unimportant					
A. Spatial design and layout inside and outside of the factory	44	66	11	00	00	4.27	0.86	0.20	Retain	To delete The words “inside and outside.”
B. Uniqueness of product development	66	55	00	00	00	4.55	0.60	0.13	Retain	Combine B and C
C. Features of factory visit	44	66	11	00	00	4.27	0.86	0.20	Retain	Combine B and C
D. Consensus of the management team	77	44	00	00	00	4.64	0.54	0.12	Retain	Combine D and E
E. Budget and personnel support	66	55	00	00	00	4.55	0.60	0.13	Retain	Combine D and E
F. Industrial link and resources integration	55	66	00	00	00	4.45	0.65	0.15	Retain	
G. Corporate theme and marketing context	59	62	00	00	00	4.82	0.40	0.08	Retain	

According to the results of the first round questionnaire survey, the original 7 assessment criteria were revised as 5 assessment criteria, including spatial design and layout of the factory, team internal structure, value of the product and factory visit, industrial link and resources integration, and corporate theme and marketing context. These 5 assessment criteria were used to conduct the second round questionnaire survey. The results are shown in Table 2:

Table 2: Results of the second round modified Delphi method questionnaire survey

Assessment Criteria	Frequency Distribution					Mean	SD	CV	Retain / Delete	Other Opinions
	5 (VI)	4 (I)	3 (N)	2 (U)	1 (VU)					
	Very important	Important	Neutral	Unimportant	Very unimportant					
A. Spatial design and layout inside and outside of the factory	44	66	11	00	00	4.27	0.86	0.20	Retain	To delete The words “inside and outside.”
B. Uniqueness of product development	66	55	00	00	00	4.55	0.60	0.13	Retain	Combine B and C
C. Features of factory visit	44	66	11	00	00	4.27	0.86	0.20	Retain	Combine B and C
D. Consensus of the management team	77	44	00	00	00	4.64	0.54	0.12	Retain	Combine D and E
E. Budget and personnel support	66	55	00	00	00	4.55	0.60	0.13	Retain	Combine D and E
F. Industrial link and resources integration	55	66	00	00	00	4.45	0.65	0.15	Retain	
G. Corporate theme and marketing context	59	62	00	00	00	4.82	0.40	0.08	Retain	

As shown in Table 2, the results of the second round modified Delphi method expert questionnaire survey showed that the experts agreed with the revised 5 assessment items after round 1. Therefore, these 5 assessment criteria were all retained, and the questionnaire survey was thus ended.

This study applied modified Delphi method to the investigation on strategies for industrial transformation of traditional tea factories. The assessment criteria with which the experts consistently agreed and the alternative schemes as recommended by them can be provided as reference for traditional tea factories to assess industrial transformation.

The 5 main assessment criteria and 4 major schemes in this study can help traditional tea factories that intend to implement industrial transformation. The 5 main assessment criteria are spatial design and layout of the factory, value of product and factory visit, team internal structure, industrial link and resources integration, and corporate theme and marketing context. The 4 major schemes are tourism factory, tourism tea factory, tea art (story) museum, and tea house.

4. Results Analysis

This study analyzed the results of the assessment criteria of questionnaire on alternative schemes, and found that the assessment criteria included spatial design and layout, value of the product and factory visit, team internal structure, industrial link and resources integration, and corporate theme and marketing context. The four alternative schemes were – tourism factory, tourism tea factory, tea house, and tea art (story) museum, and their scores are shown in Table 3.

The model was used to perform the overall assessment on alternative schemes. The priority (order) of alternative schemes was determined according to the rank of main criteria. The alternative scheme with the highest score is the most suitable alternative scheme. According to the results of scores, the order is tourism factory (0.346) > tourism tea factory (0.303) > tea art (story) museum (0.227) > tea house (0.124). In general, according to the verification results of main criteria for alternative schemes, “tourism factory” is the most suitable alternative scheme for industrial transformation of traditional tea factories.

Table 3: Scores of main criteria for alternative schemes

Assessment Criteria	Tourism Factory	Tourism TeaFactory	Tea House	TeaArt (Story) Museum
Spatial design and layout	0.043	0.041	0.012	0.029
Value of the product and factory visit	0.046	0.045	0.012	0.041
Team internal structure	0.058	0.040	0.029	0.019
Industrial link and resources integration	0.079	0.068	0.019	0.061
Corporate theme and marketing context	0.120	0.108	0.052	0.077
Total	0.346	0.303	0.124	0.227
Order	1	2	4	3

In terms of single main criterion, the analysis on the results of scores of various alternative schemes is as follows: Spatial design and layout of the factory includes the spatial layout of tourist service, such as restroom, display and sale area, presentation area, outdoor parking space, and landscape design. A tourism factory certainly has to meet the needs of tourists and provide them with tour and product sale. Therefore, the score of this assessment criterion is the highest, followed by tourism tea factory (with a difference of 0.002).

Value of the product and factory visit includes the value of product and process, industrial culture, and product uniqueness and diversity. In this criterion, there is no significant difference in the scores of three alternative schemes: tourism factory, tourism tea factory, and tea art (story) museum, suggesting that these three schemes all attach importance to their own value of visit.

In the criterion of team internal structure, the score of tourism factory is significantly higher than that of other three alternative schemes (with a difference of 0.018 from the second place). The reason is that a tourism factor has to pass various guidance accreditations and requires the promotion of an internal power, including funds, manpower, cohesiveness, team consensus, and subsequent planning and implementation.

Industrial link and resources integration includes government’s attention and resource input, tourism routes, and sufficient tourists, which all are the conditions that a tourism factory has to meet. Therefore, the score of tourism factory is the highest, and that of tea house is the lowest. The experts suggested that the development of tea houses is irrelevant to the government’s idea of supporting tea industry.

Corporate theme and marketing context includes the design of corporate identification system, package design and planning, tour manual, tour guide training, and website advisement production. In this criterion, the score of tourism factor is the highest. The reason is that a tourism factory needs a clear corporate theme, complete tour, and propaganda advertisement. Moreover, this criterion is also one of the accreditations of tourism factory. The development

of a mature tourism tea factory also almost includes the content of this criterion. However, a tourism tea factory is not as thorough as a tourism factory. Therefore, tourism tea factory is in second place. Tea house is in last place. The experts suggested that, tea house's dependence to tour and marketing is even lower.

5. Conclusion

After the literature review and modified Delphi method questionnaire survey, this study find suitable alternative scheme can be screened out based on the results. The research results can also provide an objective and effective assessment and selection criteria as basis for tea industry operators who intend to implement industrial transformation. The research results were verified and can be used as reference for the current traditional tea factories to implement industrial transformation.

The 5 assessment criteria and 4 major schemes proposed in this study can assist traditional tea factories that intend to implement industrial transformation. The results of the expert questionnaire survey investigating industrial transformation strategies for traditional tea factories showed that, among 5 main criteria, "corporate theme and marketing context" is most important, followed by industrial link and resources integration and team internal structure. Spatial design and layout of the factory is least important. Among the 5 alternative schemes investigated in this study, the results of subjects' assessment and selection showed that, the best alternative scheme is "tourism factory."

References

- [1] Li, R. F., and Li, J. H., " Dilemma of Innovation or Dilemma of Organization?", Taking Kodak Digital Camera for Example. *Journal of Technology Management*, Vol. 2, No. 17, 2012, pp. 1-30.
- [2] Chen, Y. J., " A Study on the Feasibility of Introducing Industrial Tourism to Idle Industrial Area ", Master's thesis. Graduate Institute of Land Economics, National Chengchi University, 2005.
- [3] Lin, M. L. , " Current Status of Tea Leaf Production and Marketing in Taiwan ", Current Status of Tea Leaf Production and Marketing in Taiwan, Quality Management and the Future, 2003.
- [4] Industrial Development Bureau, Ministry of Economic Affairs, Free Tour to Tourism Factory. Access date: July 21, 2014, Retrieved from : <http://www.taiwanplace21.org/>, 2012.
- [5] Executive Yuan website, Six Key Emerging Industries. Access date: July 15, 2014, Retrieved from : <http://www.ey.gov.tw/Default.html?t=672BCA8CD93FB3D032DF1378F0D963F8>, 2014.
- [6] Li, J. N , A Study on the Key Factors to the Successful Operation of Tourism and Leisure Tea Garden, Master's thesis. Graduate Institute of Business Education, National Changhua University of Education, 2001.
- [7] Tu, S. K. trans. and ed. , " Moriguchi H. Exploration of the Future of Small and Medium Enterprises – Examples of Successful Corporate Transformation ", Taipei: Hwatai Publishing, 2000.
- [8] Joyce William, Nitin Nohria and Bruce Roberson , What Really Work: The 4+2 Formula For Sustained Business Success, William F. Joyce, Nitin Nohria, and McKinsey and Company, Inc., United States, 2003.
- [9] Murry, J. W., & Hammons, J. O Delphi-a versatile methodology for conducting qualitative research. *Review of Higher Education*, Vol. 4, No. 18, 2012, pp. 423-436.
- [10] Teatea website, Access date: Retrieved from: <http://www.teatea.com.tw/>, 2014.
- [11] Yang, M. F , " A Study on Industrial Change and Transformation of Tea Industry in Executive Yuan ", Master's thesis. Graduate Institute of Hakka Political Economy, National Central University, 2008.